

IN THE CLAIMS:

1 - 4. (Cancelled)

5. (Currently Amended) Heart control apparatus, comprising:

a circuitry for generating a non-excitatory stimulus, and;

a sensor which measures a physiological activity;

a memory which stores a desired activation profile of a non-arrhythmic heart;

a controller which estimates a non arrhythmic current profile based on said physiological activity and determines an electrification pattern according to said non-arrhythmic current profile and said desired activation profile; and

stimulus application devices for applying to a heart or to a portion thereof said non-excitatory stimulus according to said electrification pattern; [[,]]

wherein said circuitry for generating a non-excitatory stimulus generates a stimulus which is unable to generate a propagating action potential, configured for applying

a first non-excitatory stimulus to a first portion of the heart, said first non-excitatory stimulus having a first effect on the biomechanical behavior of the first portion of the heart, and

a second stimulus to a second portion of the heart, said second stimulus having a second effect on the biomechanical behavior of the second portion of the heart, said first and second effects being different from each other[[,]] .

~~wherein said first effect is not prevention or amelioration of arrhythmia.~~

6 - 9. (Cancelled)

10. (Previously Presented) Heart control apparatus according to claim 5, wherein the first portion of the heart is the left ventricle and the second portion of the heart is the right ventricle.

11. (Previously Presented) Heart control apparatus according to claim 5, configured for modifying the relation between the contraction of the left ventricle and the contraction of the right ventricle.
12. (Previously Presented) Heart control apparatus according to claim 5, configured for simultaneously controlling both ventricles, one control increasing the flow from one ventricle while the other control decreases the flow from the other ventricle.
13. (Previously Presented) Heart control apparatus according to claim 5, configured for simultaneous application of said first and second stimuli.
14. (Previously Presented) Heart control apparatus according to claim 5, configured for controlling the heart for a few beats, every certain period of time.
15. (Previously Presented) Heart control apparatus according to claim 5, wherein said first effect is a modification of contractility without a change in heart rate and without affecting a regular activation of the heart.
16. (Previously Presented) Heart control apparatus according to claim 5, wherein said first effect and said second effect are configured for non-arrhythmic tissue.
17. (Previously Presented) Heart control apparatus according to claim 5, wherein said circuitry is configured for a non-arrhythmic heart.
18. (Previously Presented) Heart control apparatus according to claim 5, wherein said circuitry applies said stimuli in response to a desired increase in cardiac output and not in response to an onset of arrhythmia.
19. (Previously Presented) Heart control apparatus according to claim 5, wherein said first effect is a decrease in contractility.

20. (Previously Presented) Heart control apparatus according to claim 5, wherein said first effect is an increase in contractility.
21. (Currently Amended) Heart control apparatus according to claim 5, wherein said first non-excitatory stimulus is configured to have said first effect on non-arrhythmic tissue.
22. (Cancelled).
23. (Currently Amended) Heart control apparatus according to claim 5, wherein said first non-excitatory stimulus and said second stimulus include only non-excitatory stimuli.
24. (Cancelled).
25. (Currently Amended) Heart control apparatus according to claim 5, wherein said first non-excitatory stimulus is applied only if said circuitry detects that said heart is not in an abnormal activation.
26. (Cancelled).
27. (Cancelled).
28. (New) Heart control apparatus according to claim 5, wherein said desired activation profile define a synchronization of the contractions of the left and right left ventricles.